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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/940,020	09/29/1997	HIDEAKI FUKUZAWA	04173.0348	4500

7590 04/07/2005

FINNEGAN HENDERSON FARABOW GARRETT  
& DUNNER  
1300 I STREET NW  
WASHINGTON, DC 200053315

EXAMINER
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DAVIS, DAVID DONALD

ART UNIT	PAPER NUMBER
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2652

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

11/11

<b>Office Action Summary</b>	Application No. 08/940,020	Applicant(s) FUKUZAWA ET AL.	
	Examiner David D. Davis	Art Unit 2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 February 2000.
- 2a) ☒ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-78 is/are pending in the application.
- 4a) Of the above claim(s) 1-20, 24, 25, 27-46, 49-59, 66 and 76 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-23, 26, 47, 48, 60-65, 67-75, 77 and 78 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) \_\_\_\_\_.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

**Attachment(s)**

- |   |  |
|---|--|
| 14) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 17) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 15) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 18) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 16) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 19) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 22, 26, 70, 71, 73 and 75 are rejected under 35 U.S.C. 102(e) as being anticipated by Iwasaki et al (US 6,636,399).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

As per claim 70, figure 8 of Iwasaki et al shows a magnetoresistance device including a substrate having a main surface. Figure 8 also shows a magnetoresistance effect film 14 formed on the main surface of the substrate and having a magnetic field detecting portion. Figure 8 additionally shows a pair of bias magnetic field applying films each being disposed adjacent to both edge portions of the magnetoresistance effect film. Each of the bias magnetic field applying films includes a hard magnetic film 37 containing Co as a structural element, as disclosed in column 15, lines 47-59.

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Additionally disclosed in column 15, lines 47-59 is an underlayer having a total thickness of 5 nm, which is between 5 to 50 nm, disposed between the substrate and the hard magnetic film 37. The underlayer is composed of an amorphous layer formed on (Note: "on" is defined as "Used to indicate position above and supported by or in contact with" according to *The American Heritage® Dictionary of the English Language, Fourth Edition.*) the main surface of the substrate and a metal crystal layer formed on they amorphous layer.

As per claim 22, column 15, lines 47-59 of Iwaskai et al discloses the hard magnetic film 37 containing Co as a structural element having Co(110) oriented perpendicular to the surface.

As per claim 26, Iwaskai et al shows in figure 8 the pair of bias magnetic field applying films are abutted against the magnetoresistance effect film. As per claim 71, Iwaskai et al discloses in column 14, lines 16-24 that hard magnetic film 37 is composed of CoPt alloy.

As per claim 73, Iwaskai et al discloses that the magnetoresistance effect film is a spin valve film including a ferromagnetic film 16 and a non-magnetic film 17. As per claim 75, Iwaskai et al discloses that the metal crystal layer is formed of a crystal metal material being Cr.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

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claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 72, 74 and 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki et al (US 6,636,399) in view of Applicant's Admitted Prior Art (as shown in figure 36 and described in pages 1-16). Iwasaki et al discloses the claimed invention. See description *supra*.

However, Iwasaki et al is silent as to a hard magnetic having a bi-crystal structure. Iwasaki et al is also silent as to a hard magnetic film having a residual magnetization  $M_r$  of 650 emu/cc. Iwasaki et al is additionally silent as to an upper and lower shield layer having upper and lower gaps.

AAPA discloses that the hard magnetic film has a bi-crystal structure, as described in the paragraph bridging pages 8 and 9. The paragraph bridging pages 7 and 8 and the full first paragraph on page 9 also disclose that the hard magnetic film 2 containing Co as a structural element has Co(110) oriented perpendicular to the surface. Page 2, lines 14-18 of AAPA also discloses that hard magnetic film 2 is composed of CoPt.

The first full paragraph on page 9 also discloses a hard magnetic film having a bi-crystal structure. Figure 36 of AAPA shows lower shield layer 6 with a magnetoresistance effect device

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formed on layer 6 through lower reproduction magnetic gap 4. Figures 36 of AAPA also shows upper magnetic shield layer 7 form on upper reproduction magnetic gap 5.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide the hard magnetic film of Iwasaki et al with a bi-crystal structure as taught by AAPA. The rationale is as follows: one of ordinary skill in the art at the time the invention was made would have been motivated to provide the hard magnetic film of Iwasaki et al with a bi-crystal structure so as to provide a structure with low noise. See the paragraph bridging pages 8 and 9 of AAPA.

It also would have been obvious to a person having ordinary skill in the art at the time the invention was made to specify that the residual magnetization of the hard magnetic film of Iwasaki et al as modified by AAPA is an Mr of 650 emu/cc or more. The rationale is as follows: the purpose of the hard magnetic film is to provide a bias. The residual magnetization need not be 650 emu/cc to provide that bias. Realizing, this, one of ordinary skill in the art at the time the invention was made would have been motivated to specify the residual magnetization of Iwasaki AAPA, which flows from the bi-crystal Co structural element of AAPA and is well within the purview of a skilled artisan and absent an unobvious result, "so as to properly apply a bias magnetic field to various magnetic sensible layers". See the first full paragraph on page 3 of AAPA.

It additionally would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide the magnetic head of Iwasaki et al with an upper and lower shield having upper and lower gaps as taught by AAPA. The rationale is as follows: one of ordinary skill in the art at the time the invention was made would have been motivated to

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provide a head with upper and lower shields and gaps to provide a shield type magnetic heads (see the paragraph bridging pages 2 and 3 of AAPA) so as to effectively contain and concentrate the magnetic flux in the magnetic head.

6. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwasaki et al (US 6,636,399) in view of Applicant's Admitted Prior Art (as shown in figure 36 and described in pages 1-16) and Romankiw (US 3,908,194). Iwasaki as modified by Applicant's Admitted Prior Art (AAPA) discloses the claimed invention description supra. However, Iwasaki et al as modified by AAPA is silent as to a magnetic recording/reproducing head.

Romankiw shows in figure 9, for example, a reproducing head and a recording head. The recording head has a lower magnetic pole 224 in common with the lower magnetic shield layer 224 of the magnetic head. Record magnetic gap is formed on lower magnetic pole 224. Upper magnetic pole 241 is formed on the record magnetic gap. Figure 9 also shows record coil 228 for supplying a record magnetic field to the lower magnetic pole 224 and the upper magnetic pole 241.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide the reproducing magnetoresistive device of Iwasaki as modified by AAPA with a reproducing head to form a merged or combined head as taught by Romankiw. The rationale is as follows: one of ordinary skill in the art at the time the invention was made would have been motivated to provide a reproducing head with a recording head to form a merged or combined head so as to provide "a head which permits reading the material just

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written in a single package when the write head precedes the read head." See column 2, lines 12-14 of Romankiw.

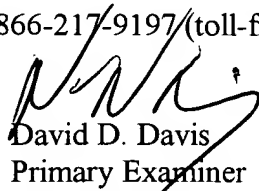
***Response to Arguments***

7. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David D. Davis whose telephone number is 571-272-7572. The examiner can normally be reached on Monday thru Friday between 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on 571-272-7579. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
David D. Davis  
Primary Examiner  
Art Unit 2652

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